



NSAI
Standards

Irish Standard
I.S. EN ISO/ASTM 52915:2017

Specification for additive manufacturing file format (AMF) Version 1.2 (ISO/ASTM 52915:2016)

I.S. EN ISO/ASTM 52915:2017

Incorporating amendments/corrigenda/National Annexes issued since publication:

The National Standards Authority of Ireland (NSAI) produces the following categories of formal documents:

I.S. xxx: Irish Standard — national specification based on the consensus of an expert panel and subject to public consultation.

S.R. xxx: Standard Recommendation — recommendation based on the consensus of an expert panel and subject to public consultation.

SWiFT xxx: A rapidly developed recommendatory document based on the consensus of the participants of an NSAI workshop.

This document replaces/revises/consolidates the NSAI adoption of the document(s) indicated on the CEN/CENELEC cover/Foreword and the following National document(s):

NOTE: The date of any NSAI previous adoption may not match the date of its original CEN/CENELEC document.

This document is based on:

EN ISO/ASTM 52915:2017

Published:

2017-02-15

This document was published under the authority of the NSAI and comes into effect on:

2017-03-06

ICS number:

25.030

35.240.50

NOTE: If blank see CEN/CENELEC cover page

NSAI
1 Swift Square,
Northwood, Santry
Dublin 9

T +353 1 807 3800
F +353 1 807 3838
E standards@nsai.ie
W NSAI.ie

Sales:
T +353 1 857 6730
F +353 1 857 6729
W standards.ie

Údarás um Chaighdeáin Náisiúnta na hÉireann

National Foreword

I.S. EN ISO/ASTM 52915:2017 is the adopted Irish version of the European Document EN ISO/ASTM 52915:2017, Specification for additive manufacturing file format (AMF) Version 1.2 (ISO/ASTM 52915:2016)

This document does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with this document does not of itself confer immunity from legal obligations.

In line with international standards practice the decimal point is shown as a comma (,) throughout this document.

This page is intentionally left blank

EUROPEAN STANDARD

EN ISO/ASTM 52915

NORME EUROPÉENNE

EUROPÄISCHE NORM

February 2017

ICS 25.030; 35.240.50

English Version

**Specification for additive manufacturing file format (AMF)
Version 1.2 (ISO/ASTM 52915:2016)**

Spécification normalisée pour le format de fichier pour
la fabrication additive (AMF) Version 1.2 (ISO/ASTM
52915:2016)

Spezifikation für ein Dateiformat für Additive
Fertigung (AMF) Version 1.2 (ISO/ASTM 52915:2016)

This European Standard was approved by CEN on 17 January 2017.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

EN ISO/ASTM 52915:2017 (E)

Contents	Page
European foreword.....	3

European foreword

The text of ISO/ASTM 52915:2016 has been prepared by Technical Committee ISO/TC 261 “Additive manufacturing” of the International Organization for Standardization (ISO) and has been taken over as EN ISO/ASTM 52915:2017 by Technical Committee CEN/TC 438 “Additive Manufacturing” the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by August 2017, and conflicting national standards shall be withdrawn at the latest by August 2017.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Endorsement notice

The text of ISO/ASTM 52915:2016 has been approved by CEN as EN ISO/ASTM 52915:2017 without any modification.

This page is intentionally left blank

**INTERNATIONAL
STANDARD**

**ISO/ASTM
52915**

Second edition
2016-02-15

**Specification for Additive
Manufacturing File Format (AMF)
Version 1.2**

*Spécification normalisée pour le format de fichier pour la fabrication
additive (AMF) Version 1.2*



Reference number
ISO/ASTM 52915:2016(E)

© ISO/ASTM International 2016

ISO/ASTM 52915:2016(E)



COPYRIGHT PROTECTED DOCUMENT

© ISO/ASME International 2016, Published in Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester. In the United States, such requests should be sent to ASTM International.

ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

ASTM International
100 Barr Harbor Drive, PO Box C700
West Conshohocken, PA 19428-2959, USA
Tel. +610 832 9634
Fax +610 832 9635
khooper@astm.org
www.astm.org

Contents

Page

Foreword	iv
Introduction	v
1 Scope	1
2 Terms and definitions	1
3 Key considerations	2
3.1 General.....	2
3.2 Guidelines for the inclusion of future new elements.....	3
4 Structure of this specification	3
5 General structure	4
6 Geometry specification	5
6.1 General.....	5
6.2 Smooth geometry.....	6
6.3 Restrictions on geometry.....	7
7 Material specification	7
7.1 General.....	7
7.2 Mixed and graded materials and substructures.....	9
7.3 Porous materials.....	9
7.4 Stochastic materials.....	10
8 Colour specification	10
8.1 General.....	10
8.2 Colour gradations and texture mapping.....	11
8.3 Transparency.....	12
9 Texture specification	12
10 Constellations	12
11 Metadata	13
12 Compression and distribution	13
13 Minimal implementation	14
Annex A (informative) AMF XML schema implementation guide	15
Annex B (informative) Performance data and future features	23
Bibliography	26

ISO/ASTM 52915:2016(E)

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: [Foreword - Supplementary information](#)

The committee responsible for this document is ISO/TC 261, *Additive manufacturing*, in cooperation with ASTM F 42.91, *Terminology*, on the basis of a partnership agreement between ISO and ASTM International with the aim to create a common set of ISO/ASTM standards on Additive Manufacturing.

This second edition cancels and replaces the first edition (ISO/ASTM 52915:2013), which has been technically revised. This revision contains changes to normative language and details of a minimum implementation, as well as corrections and clarifications.

Introduction

This International Standard describes an interchange format to address the current and future needs of additive manufacturing technology. For the last three decades, the stereolithography (STL) file format has been the industry standard for transferring information between design programs and additive manufacturing equipment. An STL file defines only a surface mesh and has no provisions for representing colour, texture, material, substructure and other properties of the fabricated object. As additive manufacturing technology is evolving quickly from producing primarily single-material, homogeneous objects to producing geometries in full colour with functionally-defined gradations of materials and microstructures, there is a growing need for a standard interchange file format that can support these features.

The Additive Manufacturing File Format (AMF) has many benefits. It describes an object in such a general way that any machine can build it to the best of its ability, and as such is technology independent. It is easy to implement and understand, scalable and has good performance. Crucially, it is both backwards compatible, allowing any existing STL file to be converted, and future compatible, allowing new features to be added as advances in technology warrant.

Specification for Additive Manufacturing File Format (AMF) Version 1.2

1 Scope

This International Standard provides the specification for the Additive Manufacturing File Format (AMF), an interchange format to address the current and future needs of additive manufacturing technology.

The AMF may be prepared, displayed and transmitted provided the requirements of this specification are met. When prepared in a structured electronic format, strict adherence to an extensible markup language (XML)^[1] schema is required to support standards-compliant interoperability.

A W3C XML schema definition (XSD) for the AMF is available from ISO from <http://standards.iso.org/iso/52915> and from ASTM from www.astm.org/MEETINGS/images/amf.xsd. An implementation guide for such an XML schema is provided in [Annex A](#).

It is recognized that there is additional information relevant to the final part that is not covered by the current version of this International Standard. Suggested future features are listed in [Annex B](#).

This International Standard does not specify any explicit mechanisms for ensuring data integrity, electronic signatures and encryptions.

2 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

2.1

AMF consumer

software reading (parsing) the Additive Manufacturing File Format (AMF) file for fabrication, visualization or analysis

Note 1 to entry: AMF files are typically imported by additive manufacturing equipment, as well as viewing, analysis and verification software.

2.2

AMF editor

software reading and rewriting the Additive Manufacturing File Format (AMF) file for conversion

Note 1 to entry: AMF editor applications are used to convert an AMF from one form to another, for example, convert all curved triangles to flat triangles or convert porous material specification into an explicit mesh surface.

2.3

AMF producer

software writing (generating) the Additive Manufacturing File Format (AMF) file from original geometric data

Note 1 to entry: AMF files are typically exported by computer-aided design (CAD) software, scanning software or directly from computational geometry algorithms.

2.4

attribute

characteristic of data, representing one or more aspects or descriptors of the data in an element

Note 1 to entry: In the XML framework, attributes are characteristics of elements.

This is a free preview. Purchase the entire publication at the link below:

[Product Page](#)

-
- [Looking for additional Standards? Visit Intertek Inform Infostore](#)
 - [Learn about LexConnect, All Jurisdictions, Standards referenced in Australian legislation](#)
-